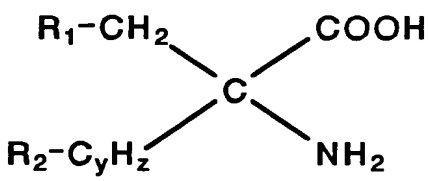
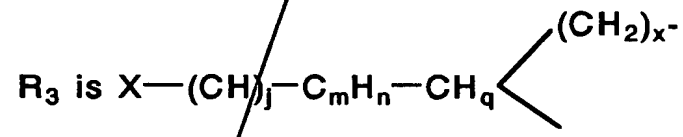
We claim:

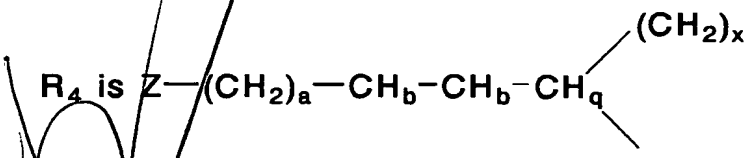
1. An amino acid analog having the general structure



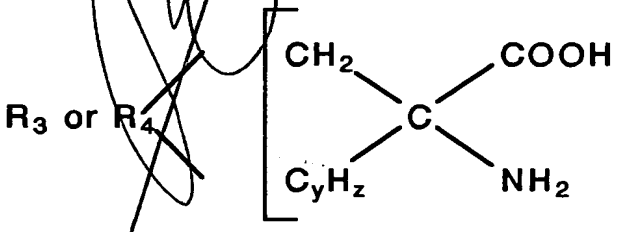
where R_1 is X, X—CH = CH—, R_3 or R_4

R_2 is H, or R_3 if R_1 is R_3 or R_4 if R_1 is R_4,



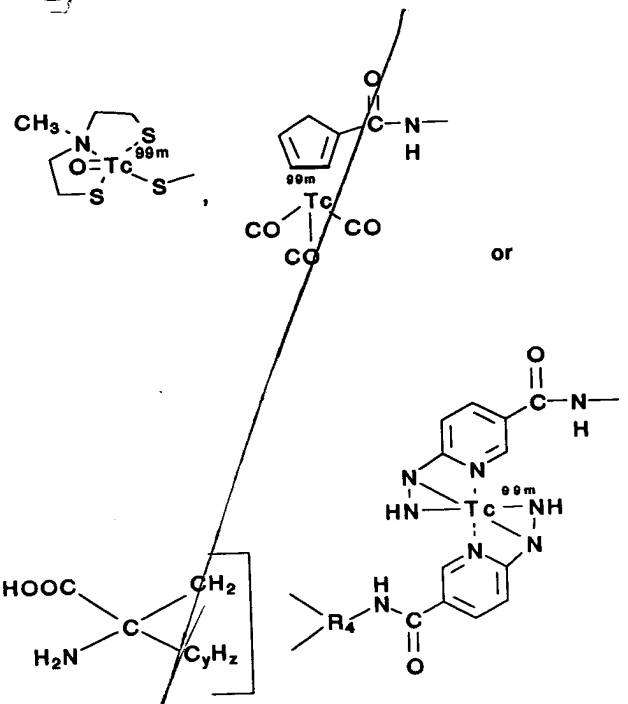


such that



is formed

where a is 1, 2 or 3,
b is 0, 1 or 2,
x is 0 or 1,
y is 1 or 2,
z is 1, 2, 3 or 4 and z > y if y is 2,
q is 1 or 0 if n is 1 and j is 0,
n is 1 or 2, but 0 if m is 0,
m is 0 or 1,
j is 0 or 1,
X is F, ^{18}F, I, ^{123}I, ^{125}I, ^{131}I, Br, ^{75}Br, ^{76}Br, ^{77}Br, ^{82}Br, or At and
Z is



1 2. A compound of claim 1, wherein R_1 and R_2 = R_3.

3. A cyclic compound according to claim 1 wherein

x is 0
y is 1
z is 2
q is 1
m is 0, and
j is 0

4. A compound according to claim 3 wherein X is F, ^{18}F, I or ^{123}I.

5. A compound according to claim 3 wherein X is ^{18}F.

6. A compound of claim 1 wherein R_1 and $R_2 \neq R_3$.

7. A compound according to claim 6 wherein X is F or ^{18}F.

8. A compound according to claim 1 wherein R_1 and $R_2 = R_3$,

x is 0 or 1
y is 2
z is 4
q is 1
m and j are each 0, and
X is F, ^{18}F, I or ^{123}I.

9. A compound according to claim 8 wherein

x is 1
X is ^{18}F.

10. The compound of claim 8 wherein x is 0 and X is ^{123}I.

11. A compound according to claim 8 wherein x is 1 and X is ^{18}F.

12. A compound according to claim 1

wherein R_1 and $R_2 = R_3$
x is 0
y is 1
z is 2
q is 0
m is 1
n is 1
j is 0, and
X is F, ^{18}F, I or ^{123}I.

13. A compound according to claim 1

wherein R_1 and $R_2 = R_3$
x is 1
y is 1
z is 1
q is 0
m and j are 0, and
X is F, ^{18}F, I or ^{123}I.

14. A compound according to claim 13 wherein X is ^{123}I.

15. A compound according to claim 1

wherein R_1 and $R_2 = R_3$
x is 0
y is 1
z is 2
q is 1
m is 1
n is 1
j is 1, and
X is F, ^{18}F, I or ^{123}I.

16. The compound of claim 15 wherein X is ^{123}I.

17. A compound according to claim 1

wherein R_1 and R_2 = R_3
x is 0
y is 1
z is 2
q is 0
m is 0
j is 1, and
X is F, ^{18}F, I or ^{123}I.

18. The compound of claim 17 wherein X is ^{123}I.

19. A compound according to claim 1

wherein R_1 is X-CH=CH-
R_2 is H
y is 1 and
z is 2.

20. The compound of claim 19 wherein X is ^{123}I.

21. A compound according to claim 1

wherein R_1 and R_2 = R_3
x is 0 or 1
y is 2
z is 4
q is 1
m is 1
n is 1
j is 1, and
X is F, ^{18}F, I or ^{123}I.

22. The compound of claim 21 wherein X is ^{18}F.

23. The compound of claim 21 wherein X is ^{123}I.

24. A compound according to claim 1

wherein R_1 and R_2 = R_3
x is 0 or 1
y is 2
z is 4
q is 0
m is 0
j is 1, and
X is F, ^{18}F, I or ^{123}I.

25. The compound of claim 24 wherein X is ^{18}F.

26. The compound of claim 24 wherein X is ^{123}I.

27. A compound according to claim 1 wherein R_1 is R_4.

B 28. A compound according to claim 27 wherein Z is

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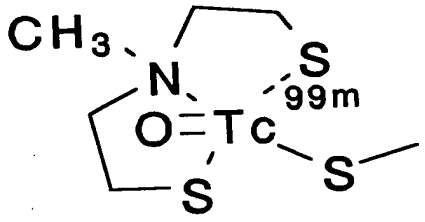

29. A compound according to claim 28 wherein a is 1, 2 or 3 and b is 0.

30. A compound according to claim 28 wherein a is 1, 2 or 3 and b is 1.

31. A compound according to claim 28 wherein a is 1, 2 or 3 and b is 2.

32. A compound according to claim 28 wherein Z is

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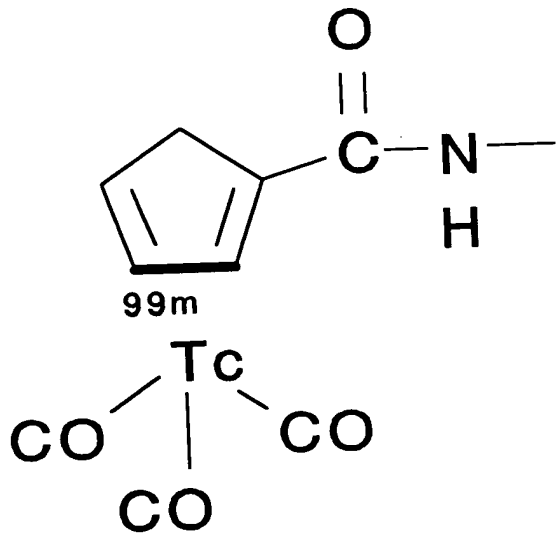

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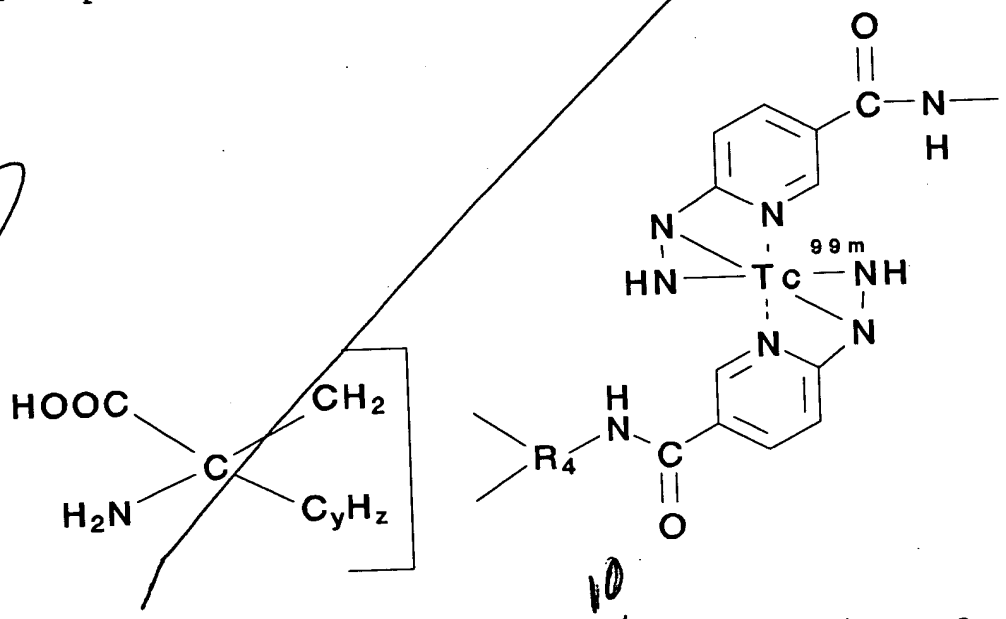
33. A compound according to claim 32 wherein a is 1, 2, or 3 and b is 0.

34. A compound according to claim 32 wherein a is 1, 2 or 3 and b is 1.

35. A compound according to claim 32 wherein a is 1, 2 or 3 and b is 2.

36. A compound according to claim 28 wherein Z is



37. A compound according to claim 36 wherein a is 1, 2, or 3 and b is 0.

38. A compound according to claim 36 wherein a is 1, 2, or 3 and b is 1.

39. A compound according to claim 36 wherein a is 1, 2, or 3 and b is 2.

40. A method of *in situ* tumor imaging by ~~positron emission tomography of~~ single photon emission tomography comprising:

administering to a subject suspected of having a tumor an image-generating amount of a compound according to claim 1, and

measuring the distribution of the compound in the subject by ~~positron emission tomography or~~ single photon emission tomography.